Appendix C.1

Compiler Summary

       Sitebldr is a PASCAL based program designed to aid SuperHarm in simulations of residential systems. **Sitebldr** prompts the user for system information and then builds the text file input needed by SuperHarm.

The best way to explain the program is with an example. The example used is a residential system consisting of three families: the Robins, Jones and Smith families. The system is shown in Figure 1. The loads at each home and their connections are shown in Table A.
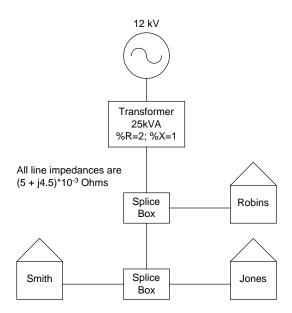

Fig. 1. Example System

Table A. Load Connections

Robins		Smith		Jones	
Appliance	Phase	Appliance	Phase	Appliance	Phase
16. Drill	A	1. Linear-2kW	AB	46. Vacuum	A
55. Honda	AB	12. Copier	B		
41. Stereo	B				

The number corresponding to each load (ie. 16 for the drill) is found in an Excel file included with the program. These numbers are used when selecting loads for the homes. The following section is the prompts encountered when using the program. Data entered by the user is in bold.

```
What would you like to name the output file? demo.sha

Please enter the following data for the distribution transformer:

                      kVA rating:   25
          Primary Side Voltage (kV):   12
                     Reactance (%):   1
                    Resistance (%):   2
```

```
How many homes are in this system?        3
How many splice boxes are in this system? 2


****************************************************
* In this section you will be asked to give names *
* to each home and splice box.  This is for your   *
* information.  Please do not use duplicate names. *
* There is a 30 character maximum on the names. A  *
* good example of a name for a home is the street  *
* address.                                         *
****************************************************


Please press ENTER to continue.

Please give a descriptive name to home 1:
Robins

Please give a descriptive name to home 2:
Smith

Please give a descriptive name to home 3:
Jones

Please give a descriptive name to splice box 1:
Main_sbox

Please give a descriptive name to splice box 2:
Jones/Smith_sbox


****************************************************
* In this section you will be prompted for the    *
* loads connected to each home and their phases.   *
* Use the load list provided with this program.    *
* The list is also contained in the Excel file     *
* loads.xls.  Use 0 to indicate that no more loads *
* are connected to a home.                          *
****************************************************


Press ENTER to continue.

Please enter load 1 for home Robins:   16
Please select the phase.
   1) Phase A
   2) Phase B
   3) Phase AB
   1

Please enter load 2 for home Robins:   55
Please select the phase.
   1) Phase A
   2) Phase B
   3) Phase AB
   3
```

```
Please enter load 3 for home Robins:   41
Please select the phase.
   1) Phase A
   2) Phase B
   3) Phase AB
   2

Please enter load 4 for home Robins:   0

Please enter load 1 for home Smith:   1
Please enter the size of the linear load (kW):   2
Please select the phase.
   1) Phase A
   2) Phase B
   3) Phase AB
   3

Please enter load 2 for home Smith:   12
Please select the phase.
   1) Phase A
   2) Phase B
   3) Phase AB
   2

Please enter load 3 for home Smith:   0

Please enter load 1 for home Jones:   46
Please select the phase.
   1) Phase A
   2) Phase B
   3) Phase AB
   1
Please enter load 2 for home Jones:   0



   ****************************************************
   * In the following section you will be prompted   *
   * for information concerning adjacencies. For each*
   * home and splice box you will be given a list of *
   * available nodes.   Enter the integer            *
   * corresponding to the first connection and press *
   * ENTER.  You will  then be prompted for the branch*
   * reactance and resistance.  The units are in     *
   * milli-Ohms.                                     *
   ****************************************************


   Press ENTER to continue.

   Select a node connected to Robins:
      0) No more connections          2) Smith
      3) Jones                        4) Main_sbox
      5) Jones/Smith_sbox             6) Transformer
      4
```

```
For the branch that connects
Robins to Main_sbox:
Please enter the reactance (mOhms):    4.5
Please enter the resistance (mOhms):   5

Select a node connected to Robins:
   0) No more connections          2) Smith
   3) Jones                        5) Jones/Smith_sbox
   6) Transformer
   0

Select a node connected to Smith:
   0) No more connections          3) Jones
   4) Main_sbox                    5) Jones/Smith_sbox
   6) Transformer
   5

For the branch that connects
Smith to Jones/Smith_sbox:
Please enter the reactance (mOhms):    4.5
Please enter the resistance (mOhms):   5

Select a node connected to Smith:
   0) No more connections          3) Jones
   4) Main_sbox                    6) Transformer
   0
Select a node connected to Jones:
   0) No more connections          4) Main_sbox
   5) Jones/Smith_sbox             6) Transformer
   5

For the branch that connects
Jones to Jones/Smith_sbox:
Please enter the reactance (mOhms):    4.5
Please enter the resistance (mOhms):   5

Select a node connected to Jones:
   0) No more connections          4) Main_sbox
   6) Transformer
   0

Select a node connected to Main_sbox:
   0) No more connections          5) Jones/Smith_sbox
   6) Transformer
   5

For the branch that connects
Main_sbox to Jones/Smith_sbox:
Please enter the reactance (mOhms):    4.5
Please enter the resistance (mOhms):   5

Select a node connected to Main_sbox:
   0) No more connections          6) Transformer
```

```
    6
```

For the branch that connects
Main_sbox to Transformer:
Please enter the reactance (mOhms):   **4.5**
Please enter the resistance (mOhms):   **5**

Select a node connected to Main_sbox:
  0) No more connections
  0

Select a node connected to Jones/Smith_sbox:
  0) No more connections   6) Transformer
  0

What title would you like to give this simulation? **3 Homes**

The output file demo.sha is now ready to be used as a SuperHarm input. The text file created by
the above steps is shown below.

```
TITLE
TITLE1="3 Homes"

OPTIONS
IGNOREISLANDS = Yes
OPTIMALORDER  = Yes

!VOLTAGE SOURCE STATEMENT
! Parameters:
!    1 - Name
!    2 - Output
!    3 - Magnitude (kV)

#library models.shl VS (Source, Prim, 120.000)

!END VOLTAGE SOURCE STATEMENT

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

!SPLIT PHASE DISTRIBUTION TRANSFORMER
! %X =  1.00E+00
! %R =  2.00E+00

TRANSFORMER

Name  =  Split_Phase
H.1   =  Prim
H.2   =  Ground
```

```
X.1   =   pccA
X.2   =   Ground
T.1   =   Ground
T.2   =   pccB
MVA   =   2.50E-02
kV.H  =   1.20E+01
kV.X  =   1.20E-01
kV.T  =   1.20E-01
%X.HX =   1.20E+00
%X.HT =   1.20E+00
%R.HX =   3.00E+00
%R.HT =   3.00E+00
%X.XT =   8.00E-01
%R.XT =   4.00E+00


!END SPLIT PHASE DISTRIBUTION TRANSFORMER


!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!


!IDEAL TRANSFORMERS-needed for homes with 240V loads
! Parameters:
!    1 - House Number

! For home Robins
#library models.shl IDLXFMR (1)


! For home Smith
#library models.shl IDLXFMR (2)



!END IDEAL TRANSFORMER STATEMENTS


!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!


!BRANCH STATEMENTS
! Parameters:
!    1 - From
!    2 - To
!    3 - Reactance (mOhm)
!    4 - Resistance (mOhm)

! For Robins to Main_sbox
#library models.shl BRNCH (h1, s1, 4.500, 5.000)


! For Smith to Jones/Smith_sbox
#library models.shl BRNCH (h2, s2, 4.500, 5.000)
```

```
! For Jones to Jones/Smith_sbox
#library models.shl BRNCH (h3, s2, 4.500, 5.000)


! For Main_sbox to Jones/Smith_sbox
#library models.shl BRNCH (s1, s2, 4.500, 5.000)


! For Main_sbox to Transformer
#library models.shl BRNCH (s1, pcc, 4.500, 5.000)


!END BRANCH STATEMENTS
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!


!LOAD STATEMENTS
! Parameters:
!    All Except LLOAD          LLOAD
!    1 - Name                  1 - Size (kW)
!    2 - Bus                   2 - Name
!                              3 - Bus


! For home Robins

#library models.shl DRILL1        (ld1_1, h1A )
#library models.shl HONDA         (ld1_2, h1AB)
#library models.shl STEREO1       (ld1_3, h1B )


! For home Smith

#library models.shl LLOAD         (2.000, ld2_1, h2AB)
#library models.shl COPIER2       (ld2_2, h2B )


! For home Jones

#library models.shl VACUUM2       (ld3_1, h3A )
!END LOAD STATEMENTS

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
RETAIN CURRENTS = Yes

!NODE REFERENCES
! h1 Robins
! h2 Smith
! h3 Jones
! s1 Main_sbox
! s2 Jones/Smith_sbox
! pcc Transformer
....
```

A list of available loads and their corresponding numbers referenced to in the program is shown below in Table C.1.A

Table C.1.A List of Available Loads

1	Linear Load		31	Mixer B
2	AC (Bottom)		32	Mixer B (Low)
3	AC (Top)		33	Monitor
4	Amplifier		34	Microwave
5	Cassette Player		35	Oven
6	CD Player A		36	Printer
7	CD Player B		37	Pump
8	Coffee Maker A		38	Range
9	Coffee Maker B		39	Satellite Dish
10	Computer A		40	Scanner
11	Computer B		41	Stereo
12	Copier		42	Toaster
13	Copier (Low Power)		43	Television A
14	Dimmer		44	Television B
15	Dishwasher		45	UPS
16	Drill		46	Vacuum
17	Dryer A		47	VCR A
18	Dryer B		48	VCR B
19	Electronic Ballast		49	Washer A
20	Refrigerator A		50	Washer B
21	Refrigerator B		51	Washer A (Spin)
22	Garage Door		52	Washer B (Spin)
23	Hair Dryer		53	Water Heater
24	Hair Dryer (Low)		54	IEC Charger
25	Heat Pump (Hi)		55	Honda Charger
26	Heat Pump (Low)		56	Electric Vehicle 3
27	Heat Pump (Medium)		57	Electric Vehicle 4
28	Lap Top		58	Electric Vehicle 5
29	Light Bulb		59	Electric Vehicle 6
30	Mixer A		60	Electric Vehicle 7